FAQ Communication over PROFIBUS

Service & SUPPORT

FDL connection over PROFIBUS between PC station and SIMATIC S5



FAQ



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Question

How do I create a FDL connection to a SIMATIC S5 over PROFIBUS for the SIMATIC NET OPC Server with the SIMATIC NET PC Software?

Answer

The instructions and notes listed in this document provide a detailed answer to this question.

1 Assignment of tasks

In this example a CP5611 is used, that implements FDL communication over the OPC Server with a S5 station on PROFIBUS.

NOTE The method described in these instructions also applies to the communications processors CP5613/14 (A2), CP5621, CP5511 and CP5512.

1.1 Condition

It is assumed that one of the two following configuration tools is installed:

• NCM PC

NCM PC is supplied with the SIMATIC NET CD and allows you to create PC projects and open STEP 7 projects. It is, however, not possible to edit S7 blocks in the STEP 7 project with this software.

 STEP 7 STEP 7 is a separate software package with which you can create S7-400, S7-300 and PC projects. S7 blocks can be edited with this software.

Only one of these tools can be installed.

In chapter 2 "Configuration of the PC station" is described the configuration of PC station so that you can use the FDL communication over PROFIBUS to exchange data between PC station and S5 station.

2 Configuration of the PC station

After successful completion of the hardware and software installation of the SIMATIC NET CD and the configuration tool and after restarting your computer, you start NCM PC or STEP 7 with "Start \rightarrow (in Windows XP: All Programs \rightarrow) SIMATIC \rightarrow SIMATIC Manager or SIMATIC NCM PC Manager or using the desktop icon of the same name.

Create a new project with "File \rightarrow New".

Figure 2-1 giving the project a name

lew Project	×
User projects	
Name Storage path	
Example F:\Program Files\SIEMENS\SIMAT	IC.NCM\S7proj\Example
<u></u>	
Name:	Туре:
PC_Station	Project
	F Library
Storage location	
:\Program Files\SIEMENS\SIMATIC.NCM\S7proj	Browse
OK Car	ncel Help

Confirm the project name you have entered (in the example: "PC_Station") with OK. An empty STEP 7 or NCM PC project is then created.



Figure 2-2 inserting the PC station	
SIMATIC NCM PC Manager - PC_Station	
Eile Edit Insert PLC View Options Window Help	
	Filter>
PC_Station C:\Program Files\SIEMENS\SIMATIC.NCM\S7p	roj\PC_Stati
PC_Station	₽₽ MPI(1)
<u> </u>	
Press F1 to get Help.	CP5611(MPI)

With the menu command "Insert \rightarrow Station \rightarrow SIMATIC PC Station", you insert the PC station.

Figure 2-3 changing the name of the PC station

SIMATIC NCM PC Manager - PC_Station	
Eile Edit Insert PLC View Options Wind	ow <u>H</u> elp
	主 🏢 💼 〈No Filter〉 🔽 🎾 😤 🗐 🖿 🕅 🕺
PC_Station C:\Program Files\SIEMEN	5\SIMATIC.NCM\S7proj\PC_Stati
PC_Station	ation Benneticity
Press F1 to get Help.	CP5611(MPI)

Give the PC station you have just inserted the same name as your computer (in the example: "PC_Station").

Now open the hardware configuration of the PC station by selecting the PC station, then pressing the right mouse button and selecting "Open Project" (STEP 7: "Open Object").

Figure 2-4 hardware configuration of the PC station

SIMATIC NCM PC Config - [PC_5	tation (Configuration) PC	_Station]				
Station Edit Insert PLC View	Options Window Help					_ <u>=</u> = ×
	6 🛍 🛍 🗈 🖻	K?				
				-		ㅋㅋ
					Eind:	nt ni
3						
5					PROFIBUS PA	
6					PROFINET IO	
					⊕	
d				, – I		
(0) PC						
Index Module	Order number	Firm	м с			
1				-		
2						
		-	++			
5						
6		_	\vdash			
8					PROFIBUS-DP slaves for SIMA	TIC S7, M7, and C7 Ec
9					(distributed rack)	
				-		
Press F1 to get Help.						

You will see an empty rack. If you cannot see the hardware catalog, click on the button marked in red.



SIMATIC NCM PC Config - [PC_SI	ation (Configuration) PC_	Station]			×
Qui Station Edit Insert PLC View	Options Window Help			_ 8	×
	8 🖦 🗊 🗆 💥	<u></u>			
0) PC			-		×1
3 4 5 6 7 8 9 9 •			× •		1
(0) PC		Em			
1 1 2 3 3 4 5 6 7 8 9 10				Image: Constraint of the constrated of the constraint of the constraint of the constraint of the	• •
Press F1 to get Help.				Chg	11.

Figure 2-5 selecting the modules from the hardware catalog

Now place your PC modules in this rack (for example by dragging them from the hardware catalog).

If you use a CP5613/14 (A2) (or CP5511 or CP5512) you will select the CP5613/14 (A2) (or CP5511 or CP5512) from the STEP7 hardware catalog.

If you use a CP5611 A2 or CP5621 you will configure these modules asCP5611.

The following dialog appears automatically after you insert the module in the PC station.



— :	~ ~		!	-11 - 1
FIGUIRE	2-h	address	assignment	dialod
iguio	20	addiooo	abolginnoin	alalog

Properties	- PROFIBUS i	nterface CP	5611 (R0/59)				×
General	Parameters						
<u>A</u> ddress:			l t	f a subnet is sele he next available	cted, address is si	uggested.	
Subnet:	networked					lew)
					P <u>r</u> o	perties	
					[)ejete	
OK					Cancel	Help	

Click on the button "New" to create a new PROFIBUS subnet. The property view of the PROFIBUS subnet will open. Change to the register "Network Settings"and set the relevant bus parameters.

Figure 2-7 configuring bus parameters for PROFIBUS subnet

Highest PROFIBUS Address:	126 💌 🗖 Change	Options
Iransmission Rate:	19.2 Kbps 93.75 Kbps 187.5 Kbps 500 Kbps 1.5 Mbps	
<u>P</u> rofile:	DP Standard Universal (DP/FMS) User-Defined	Pus Promotors



Confirm the dialog with "OK".

Figure 2-8 property view of the CP5611

General Parameters Address: Highest address: 126 Transmission rate: 1.5 Mbps Subnet: PROFIBUS(1) 1.5 Mbps F	1.5 Mbps Properties Dejete	General Parameters Address: Image: Comparison procession of the second seco	perties	- PROFIBUS interface	CP 5611 (R0/59)		
Address: EI26 Transmission rate: 1.5 Mbps Subnet: PROFIBUS(1) I.5 Mbps F	1.5 Mbps Properties Dejete	Address: I26 Highest address: 126 Transmission rate: 1.5 Mbps Subnet: PROFIBUS(1) 1.5 Mbps New Properties Dejete	ieneral	Parameters			
Highest address: 126 Transmission rate: 1.5 Mbps <u>Subnet:</u> PROFIBUS(1) F	1.5 Mbps Properties Dejete	Highest address: 126 Transmission rate: 1.5 Mbps <u>Subnet:</u> PROFIBUS(1) <u>New</u> Properties Properties Dejete	<u>A</u> ddress:		D		
Transmission rate: 1.5 Mbps Subnet: PROFIBUS(1) I.5 Mbps F	1.5 Mbps Properties Dejete	Transmission rate: 1.5 Mbps Subnet: PROFIBUS(1) Properties Dejete	Highest	address: 126			
Subnet: PROFIBUS(1)	New Properties Dejete	Subnet: PROFIBUS(1) New Properties Dejete	Transmis	ssion rate: 1.5 Mbps			
PROFIBUS(1) 1.5 Mbps	New Properties Dejete	not networked New PROFIBUS(1) 1.5 Mbps Properties Properties Dejete Dejete	<u>S</u> ubnet:				
	Properties Dejete	Properties Properties Dejete	not	networked	1.5 Mbox	Ne	ew
	Dejete	Dejete	rnorie	005(1)	1.0 Mbps	Prop	erties
	Dejete	Dejeve					مامام
							ciere
				-		 	

Connect the CP5611 to the PROFIBUS subnet which you have just configured or to a PROFIBUS subnet which already exist.

Close the property view of the CP5611 with "OK".

The configuration and networking of the CP5611 is finished now.



IT KUIIII	g - PC_Station						1×
tion <u>B</u> ear	beiten <u>E</u> infügen <u>Z</u> ie	elsystem <u>A</u> nsicht E <u>x</u> tras <u>F</u> e	nster <u>H</u> ilfe				
) 😂 🔓		16 🛍 🋍 🗈 🗖	₩ N?				
PC_Stati	ion (Konfiguration)	FAQprojekt_IE_SR			S <u>u</u> chen:	m	m
(0) PC					Profil:	Standard	•
2					⊞ ₩	PROFIBUS-DP	
3					***	PROFIBUS-PA	
5			<u></u>			SIMATIC 300	
6					÷-	SIMATIC 400	
7					Ē 🛄	SIMATIC PC Based Control 300/	/4
3	0P 5611					SIMATIC PC Station Benutzer Applikation	
10					Ū.	Controller	
						CP-Industrial Ethernet	
11				w11	E-	CP-PROFIBUS	
					1.1	JEL COLLEGE	
	(0) PC						
	0) PC Baugruppe	Bestellnummer	Firmware	MPI-Adres		→ 1 CP 5411 → 1 CP 5412 A2 → 1 CP 5412 A2 H → 1 CP 5511 → 1 CP 5511	
	0) PC Baugruppe	Bestellnummer	Firmware	MPI-Adres			
	0) PC Baugruppe	Bestellnummer	Firmware	MPI-Adres			
	0) PC Baugruppe	Bestellnummer	Firmware	MPI-Adres			
Index [1 2 3 4 5	0) PC Baugruppe	Bestellnummer	Firmware	MPI-Adres	•		_
Index [1 2 3 4 5 6	0) PC Baugruppe	Bestellnummer	Firmware	MPI-Adres	GGK1 5	CP 5411 CP 5412 A2 CP 5412 A2 H CP 5511 CP 5511 CP 5512 CP 5611 CP 5611 SW V6.0 SP4 SW V6.0 SP4 SW V6.0 SP4 SW V6.0 SP4	- - -
Index I	0) PC Baugruppe	Bestellnummer	Firmware	MPI-Adres	6GK1 50 SIMATIO S7-Verb	CP 5411 CP 5412 A2 CP 5412 A2 H CP 5511 CP 5511 CP 5511 CP 5611 CP 5612 CP 5	• • •

Figure 2-9 hardware configuration - projecting the CP5611

The module has now been placed in a slot in the rack. You can select any slot. There are no restrictions.

tation Bearbeiten Einfügen Zelsystem Ansicht Extras Eenster Hife Implement Implement Implement Implement Suchen Implement Implement Implement Suchen Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement Implement <th>HW Kon</th> <th>fig - PC_Station</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>_15</th>	HW Kon	fig - PC_Station						_15
Image: Image	ation Be	arbeiten <u>E</u> infügen <u>Z</u> ie	elsystem <u>A</u> nsicht E <u>x</u> tras <u>F</u> e	nster <u>H</u> ilfe				
Imple_Station (Konfiguration) FAUprojekt_IE_SR Sucher: Imple_Station (Konfiguration) FAUprojekt_IE_SR ProfileUS -PA Imple_Station (Konfiguration) FAUprojekt_IE_SR ProfileUS -PA Imple_Station (Free Station) SiMATIC 400 Imple_Station (ID) SiMATIC PC Based Control Imple_Station (ID) SiMATIC PC Server Imple_Station (ID) PROFILE (ID) Imple_Station (ID) PROFILE) 🛋 🕯		16 11	₩ №?				
Image: OPC Server Profile Profile Profile 1 OPC Server Profile Profile 3 Image: OPC Server Image: OPC Server Image: OPC Server 1 Image: OPC Server Image: OPC Server Image: OPC Server 1 Image: OPC Server Image: OPC Server Image: OPC Server 1 Image: OPC Server Image: OPC Server Image: OPC Server 1 Image: OPC Server Image: OPC Server Image: OPC Server 1 Image: OPC Server Image: OPC Server Image: OPC Server 2 Image: OPC Server Image: OPC Server Image: OPC Server 3 Image: OPC Server Image: OPC Server Image: OPC Server 2 Image: OPC Server Image: OPC Server Image: OPC Server 3 Image: OPC Server Image: OPC Server Image: OPC Server 4 Image: OPC Server Image: OPC Server Image: OPC Server 4 Image: OPC Server Image: OPC Server Image: OPC Server 6 Image: OPC Server Image: OPC Server Image: OPC Server 0PC Server Image	PC_Sta	ation (Konfiguration)	FAQprojekt_IE_SR			Suchen:		M1
2 OPC Server 3 PROFIBUS-DP 4 PROFIBUS-PA 5 PROFIBUS-PA 6 PROFIBUS-PA 7 Index 10 SIMATIC 400 9 ECP 5611 10 SIMATIC PC Based Control 11 Index 12 OPC Server 13 Index 14 Index 15 Index 16 Provention 17 Index 18 Index 10 Index 11 Index 12 OPC Server 13 Index 14 Index 15 Index 16 OPC Server 17 Index 18 Index 19 OPC Server 10 Index 11 Index 12 OPC Server 13 Index 14 Index 15 Index 16 Ind	2 (0) PC					Profil:	Standard	
Index Baugruppe Bestellnummer Firmware MPI Adress 1 Image: CP-PROFIBUS 2 OPC Server V6.2.1 3 Image: CP-PROFIBUS 4 Image: CP-PROFIBUS 5 Image: CP-PROFIBUS 6 Image: CP-Protocol 7 Image: CP-Protocol	2 3 4 5 6 7 8 9 7 10 11 11 12	0PC Server					ROFIBUS-DP ROFIBUS-PA ROFINET IO MATIC 300 MATIC 400 MATIC PC Based Contri MATIC PC Station Benutzer Applikation OPC Server 	ol 300 P4
Image: Construction OPC Server V6.2.1 3	Index	Baugruppe	Bestellnummer	Firmware	MPI-Adres:	÷	Controller CP-Industrial Ethernet	
3 1000 4 4 5 0PC Server 6 0PC Server für die Protokolle DP, 7 0PC Server für die Protokolle DP,	2	OPC Server		V6.2.1		ē- ē	CP-PROFIBUS	
4 • 5 • 6 • 7 •	3							
5 OPC Server 6 OPC Server für die Protokolle DP, 7 FDL, FMS, S7(subnetzübergreifend)	4					4		
6 OPC Server für die Protokolle DP, 7 FDL, FMS, S7(subnetzübergreifend	5					OPC Serv	er	
7 FDL, FMS, S7(subnetzübergreifend,	6					OPC Serv	er für die Protokolle DP,	100
ICO/TED CIMD DD Master Visco	7					FDL, FMS	SVIIsubnetzübergreifen	d], —
8 ISUTCE, SNME, DE Master Nasse	8					Sorrer,	Sider, DF Mastel Klas	•

Figure 2-10 configuring the OPC server



Select the OPC server in the hardware catalog and then drag it to any slot.

Figure 2-11 button "NetPro"



Now open the NetPro program. Use the button marked red in the toolbar in Figure 2-11 button "NetPro".

In NetPro you configure a FDL connection to exchange data between the OPC server and the S5 station.

Figure 2-12 configuring the FDL connection in NetPro

MPI(1) MPI	Netzobjekte Neue Verbindung DP-Mastersystem PROFINET IO-System	Ctrl+G	<u>∎!</u>	Ausw B	en: 41 4 ahl der Netzobjekte PROFIBUS-DP PROFIBUS-PA PROFINET IO Stationen Subnetze
(Partner ID	Partner	Tun		

Select the OPC server and choose the menu command "Insert \rightarrow New Connection" to create a new connection for the OPC server or right-click the OPC server \rightarrow "Insert \rightarrow New connection".



Insert New C	onnection	x
Connection	Partner	_
	the current project PC_Station [Unspecified] All broadcast stations All multicast stations unknown project	
Eroject: Station:	(Unspecified)	€ś
Module:		
Connection		_
<u>Type:</u>	FDL connection	
☑ <u>D</u> isplay	properties before inserting	
ОК	Apply Cancel Help	<u> </u>

Figure 2-13 Insert a new connection in NetPro

Because the communication partner isn't configured in the same S7 project like the PC station, you have to configure unspecified connection. In the dialog box "Connection Partner"you have to select "Unspecified"for the connection partner.

Furthermore you have to select the connection type "FDL connection".

Click on the button "Apply" so that the property view of the FDL connection will open.



erties - FDL conne	ction		
General Information	Addresses Options OPC	Overview	
Name (ID): FDLC	nnection1		
via <u>c</u> i. Jui so	<u>R</u> oute		

Figure 2-14 property view of the FDL connection → register "General Information"

Insert a name for the FDL connection. Following change to the register "Addresses".

Figure 2-15 property view of the FDL connection \rightarrow register "Addresses	s"
---	----

Properties - FDL conne	ction				x
General Information	Addresses	Options	OPC	Overview	
Describes the address FDL-connection.	parameters of t	ne local endp	oint of an		
	Local		Remote		
PROFIBUS	2		3]	
LSAP:	2 💌		E _		
Free layer 2 access					
OK				Cancel	Help

By indicating the PROFIBUS addresses and LSAPs you uniquely identify the FDL connection between the PC station and the S5 station.

For remote set the PROFIBUS address of the S5 station. Set the LSAPs to uniquely identify FDL connection. For local you have to set the LSAP of the PC station and for remote you set the LSAP of the S5 station.



NOTE You will have to consider the indication of the PROFIBUS addresses and LSAPs if you configure the FDL connection in the S5 station.

Confirm the property view of the FDL connection with "OK". So you come back to the dialog "Insert New Connection". Confirm this dialog with "OK".

The FDL connection which you have just configured is shown in the connection table of the PC station.

NetPro - [PC_Statio	on (Network) C:\Pi	rogram Files\\S7	proj\PC_Stati]			<u>_ ×</u>
Network Edit Inse	ert PLC <u>V</u> iew Optio	ns <u>W</u> indow <u>H</u> elp				_ 8 ×
	16 m i s		a ! <u>N</u> ?			
PROFIBUS(1)				-		ㅋㅋㅋ
PROFIBUS				100	Eind:	mt mi
					Selection of the netwo	ork
PC_St	ation				PROFIBUS-P	г А
Server 561	1				⊕-₩ PRUFINE FIL ⊕- ⊡ Stations	J
2					🗄 🧰 Subnets	
				-		
•				•		
Local ID	Partner ID	Partner	Туре	<u>*</u>		
FDL Connection1		Unknown	FDL connection			
						٤
•				•	S7, M7, and C7 (distrit	stor SIMATIC buted rack)
Ready		PC	internal (local) X 268 Y 1	59 Chc //		

Figure 2-16 connection table

Now the configuration of the of the FDL connection is finished.

You have to save the configuration in NetPro.

You have to leave open the program NetPro while initialization of the CP5431 and configuration of the FDL connection in the S5 station.

3 Configuration of the SIMATIC S5

3.1 Initialization of the CP5431 and configuration of the FDL connection

Starten Sie STEP 5 über Start → SIMATIC → STEP 5

Wechseln Sie über die Taste "F9" in das Konfigurationstool des CP5431 "SINEC NCM COM 5431".

NOTE The configuration tool "SINEC NCM COM 5431" is an additional software, which is integrated STEP5, to configure the CP5431. This software isn't included in the standard STEP 5 package. You have to order it separately.

Initialize the CP5431 using the "Edit \rightarrow CP_Init"menu.

Figure 3-1 Initialization of the CP5431



Enter the PROFIBUS address of the CP5431 (L2 address). This address has to correspond to the PROFIBUS address which you have configured for remote in NetPro (see Figure 2-15 property view of the FDL connection \rightarrow register "Addresses").

The Base SSNR specifies the CP5431 in the rack. This interface number must be used later in the block calls in the S5 program.

Apply the settings with "F7".

Open the "Edit \rightarrow Links \rightarrow S5-S5 Links" dialog.

Figure 3-2 creating the S5-S5 Link

STEP 5	and the second se	- 8
Link Editor \$5-\$5 Links	CP type: CP5431 Source : C:QFAQFDL	(EX)
Local L2 station address Remote L2 station address PRIO (H/L/I) : SSAP : 2 DSAP : 2	: d	
Parameters sending: SSNR : P ANR : P	Parameters receiving : SSNR : ANR : UII	
1 + 1 2 - 1 3	A INPUT S DELETE 6 7 0	I HELP Ik 8 Select

The following declarations have to correspond to the configuration in NetPro:

- Enter the PROFIBUS address of the CP5611 under "Remote L2 station address".
- Because the OPC server has a high priority by default, you have to select "High" for PRIO.
- To identify the link enter SSAP = 3 (in NetPro: remote LSAP of the communication partner) and DSAP =2 (in NetPro: local LSAP of the PC station).
- You have to set the "Parameters sending"and "Parameters receiving"to exchange data between PC station and S5 station. You have to enter the offset interface number of the PLC for SSNR (with a PLC offset always is 0). The job numbers which are entered under ANR you have to account when you call the SEND und RECEIVE in the S5 program.

Apply the settings with "F7".

With "Edit \rightarrow Global Network Parameters"you open the global bus parameters and bus times of the CP5431.



STEP 5	
Edit Global Network Parameters	SINEC NCM <u>CER</u> Source: NETZINCM_BPB
Highest active L2 : Cumulative topology info: No. of remote active stations :	station address in the network file : 3 D Highest station address (HSA) : <mark>126</mark>
Bus parameters: Data rate Default SAP Maximum no. of retries Medium redundancy Bus parameter data : Slot time (TSL) Setup time (TSET) Minimum station delay (min TSDR) Maximum station delay (max TSDR) Target rotation time (TTR) GAP update factor (G)	ilS00000 bps 61 1 1 1 1 1 1 1 1 1 1 1 1 1
Tenceurare2 3 4	S 6 7 OK 8 SELEC

Select the required transmission rate for data rate and recalculate the bus times again by using F1 "CALCULATE". In this example the data rate is 1500000 bit/s, which mean 1, 5 Mbit/s.

Now change again to the S7 project in NetPro to synchronize the bus times of the CP5431.

3.2 Synchronization of the bus times

Figure 3-4 opening the object properties of the PROFIBUS subnet

NetPro - [PC_Station (Network) C:\	Program Files\\S7proj\PC_Stati]		_ 🗆 🗙
Retwork Edit Insert PLC View Opt	tions Window Help		_ <u>_ 8 ×</u>
	8 <i>I</i> 8 B 2 ! !		
PROFIBUS(1) PROFIBUS PC_Station PC_Station PC_C CP Server 5611 2	Copy Ctrl+C Delete Del Print parameters Rearrange Object Properties Alt+Return	* 	Eind:
			PROFIBUS-DP slaves for SIMATIC S7, M7, and C7 (distributed rack)
Displays properties of the selected object for e	diting. PC internal (local) X 221 Y 41	Chc //.	

In NetPro right-click on the PROFIBUS subnet, which is assigned to the CP5611, and open the object properties of the PROFIBUS subnet?

Figure 3-5 property view of the PROFIBUS subnet

Highest PROFIBUS Address:	126 Y Change	Option	i\$
Iransmission Rate:	45.45 (31.25) Kbps 93.75 Kbps 187.5 Kbps 500 Kbps 1.5 Mbps		
Profile:	DP Standard Universal (DP/EMS) User-Defined		
		<u>B</u> us Paran	neters

Figure 3-6 bus parameters

Entry-ID: 16733087

In the property view of the PROFIBUS subnet \rightarrow register "Network Settings" you select the transmission rate 1,5 MBit/s and the bus profile "User Defined".

You have to click on the button "Bus Parameters…". The following dialog will open.

PROFIBUS(1)					2
Bus Parameters	Ľ.				
Turn on gyc	lic distribution o	f the bus (parameters		
<u>T</u> slot_Init:	3000	t_bit	T slot:	3000	t_bit
<u>M</u> ax.Tsdr:	980 🛨	t_bit	Tid2:	980	t_bit
Min. Tsdr:	150 🛨	t_bit	Trdy:	150	t_bit
T <u>s</u> et:	80 ÷	t_bit	Tid1:	195	t_bit
Tgui:	0 -	t_bit	Ttr:	50000	t_bit
			=	33.3	ms
Gap Factor:	50 🕀		Ttr typically:	8274	t_bit
Retry limit:	1.3		=	5.5	ms
			Watchdog	66000	1.63
				44 7	(_DK
				Recalculate	1113
ОК				Cancel	Help

You have to adapt the bus times which are displayed according the settings in the CP5431 of the S5-station (see Figure 3-3 global network parameters).

Following confirm the dialog with "OK".

You have to save and compile S7 project. Therefore select the PC station in NetPro and click the button "Save and Compile" in the toolbar. This updates the information in the S7 project.

Figure 3-7 Save and Compile

Compile Compile and check everything	5
Compile and check everything	
Compile changes only	



NOTE Warning indications can be displayed while proceeding with the "Save and Compile" of a S7 project. Warnings serve as piece of information and have no functional effect. In case error warnings occur, search for possible divergences in the previous steps of the instructions.

4 Download the configuration into PC station

Open the "Station Configuration Editor" in the Windows START Menu \rightarrow "Station Configuration Editor" or with the following button in the Windows task bar

Figure 4-1 button "Station Configuration Editor"



Figure 4-2 Station Configuration Editor

Station:	PC_Station		Mode:	RUN	_P		
Index	Name	Туре	Ring	Status	Run/Stop	Conn	
1		******				1	
2							
3							
4							
5	-			-			
6	-			-			4
7				-			
8				_	_		-1
9				_			-
10				_			
11							+
12	-			-			+
13							+
14				-			+
16				-			÷
17	1	1				1	
Vew dia	gnostic entry arrive	edi	1) - laba	1	Rive ON	
<u>S</u> tat	ion Name	Import Station	<u>`</u>	Jeiere	 Dis	able Stati	on

Click the button "Import Station...". A message about restarting the PC station will open.



		4			
FIGURE 43	messade	about	restantino	The PC	Station
i iguio i o	moodage	aboat	rootarting		otation

Station Cor	nfiguration Editor	×
<u>.</u>	 The station will be restarted. Make sure that no communication is active over the components involved. Do you want to import the station? 	
<u>Y</u> es	No	

Confirm the message about restarting the PC station with "Yes". The following dialog to select the XDB file, which should be import, opens.

Figure 4-4 selecting the XDB file



In this dialog you enter the path of the XDB file. The XDB file is always created in the project by NCM PC / STEP 7 (see Figure 2-1 giving the project a name). With the combo box "Search in: "you navigate in the path of the XDB file.



	Name	Туре	Status	Error	
1					
2	OPC Server	OPC Server			
3	12				
4					
5					
6					
7					-
8					
9	IF CP 5611	CP 5611			
10					
11					
12					
13					
14					
15					1
16					
15	The XDB import is p	ossible. Refer to t	he list abov	re for the configuration.	
Ç	The XDB import is p	ossible. Refer to t	he list abov	re for the configuration.	

Figure 4-5 Information from the XDB file

As information, you can see once again which modules and applications are configured in the XDB file.



tation:	PC_Station		Mode:	RUN	LP		
Index	Name	Туре	Bing	Status	Bun/Stop	Conn	
1						,,	П
2	OPC Server	OPC Server		1	0		
3					-		
4							
5							
6							
7							
8							-
9	EP 5611	CP 5611		<u> </u>	\bigcirc	φ.	
10				_			
11							
12							
13			_				
14							
15							
17							-
lour dia	mastia antru arrivadi						
iew ulaj	gnosiic enity anived:						
	<u>A</u> dd	<u>E</u> dit		<u>D</u> elete		Ring <u>O</u> N	
Stat	ion Name	Import Station	1		Dis	able Statio	h

Now the import of the XDB file is finished and the configuration is downloaded.

In the column connection, which is marked red, you see that the connection is also been downloaded.

So the configuration of the PC station is finished.

5 Download the configuration into CP5431

Change to the configuration tool of the CP5431.

Apply the configuration of the bus time with "F7".

Synchronize the network with "Network \rightarrow Synchronize Network". The globally set bus parameters are adopted in the local bus parameters.

Then download the configuration to the CP5431 with "Transfer \rightarrow FD \rightarrow CP".

Return to the STEP 5 configuration dialog with "File \rightarrow Exit" and "ESC".

6 Description of the S5 program

Synchronization of the CP5431 with the PLC using the SYNCHRON call in the start-up OBs

Insert the following start-up OBs in your S5 program:

- OB20
- OB21
- OB22

In these OBs you have to program the FB125 "SYNCHRON" call, which synchronizes the PLC and the CP5431.

Figure 6-1 FB125 "SYNCHRON" call

STEP 5 08 20 Segment 1 FJU FB 125	
Name :SYNCHRON SSNR : KY 0,8 BLGR : KY 0,255 PAFE : FY 20	
: BE	
Addresses Symb. S 2 2Reference Search	W

Calling the SEND/RECEIVE block in OB1

Create the OB1. Form the RLO = 1 with the two statements:

- O M0.0
- ON M0.0

Insert the SEND block call (FB120).



Figure 6-2 FB120 "SEND" call

STEP 5		
0B 1		C:HTB135ST.S5D
Segment :0	F 0.0	
: ON	F 0.0 FR 120	
Name :SE	ND	
SSNR A-NR	KY 0,8 Ky 0.1	Interface number Job number
ANZW	FW	displayword
DBNR	KS 06 KY 0,10	Source type datablock number
QANE :	KF +0	Begin of sendbuffer
PAFE	FY 30	Length of Senaballer

NOTICE Specify the length of the send area in words.

Form an RLO = 1 with the two statements:

- O M0.0
- ON M0.0

Then add the RECEIVE block call (FB121) after this.

Figure 6-3 FB121 "RECEIVE" call

-	: 0 : 0N	F	0.0				
Name SSNR A-NR ANZW ZTYP DBNR ZANF ZLAE PAFE	REC	FB T EIVE KY O FW KS D KY O KF + KF - FY	21 ,8 ,101 2 B ,10 -0 1 31	Inter Job n displ Desti datab begin Lengt	face umber aywor natio lock of r h of	number d n type number eceivet receive	uffer Buffer
Add	resse	s <mark>f</mark> 2Ref	erence	Symb. Searc	SWA sh 4	No Com Jump	S Seg Fo

NOTE The "SEND"and "RECEIVE"blocks are executed only when RLO=1 prior to the call.

If the length of the receive area is preset with "-1" the length of the data will detect automatically (parameter: ZLAE = -1).



Save OB1 with "F7".

Creating the send and receive buffer

Because the send and receive buffer must be located in DB10, this must be created in the project and declared with an adequate length.

Then download the entire program to the S5 station.

7 Start of the OPC Scout

Start the OPC Scout with "Start \rightarrow SIMATIC \rightarrow SIMATIC NET \rightarrow OPC Scout".

Double-click the "OPC.SimaticNet"for connection with the SIMATIC NET OPC server. In the dialog that appears, enter a suitable group name and confirm this with OK.

Figure 7-1 connecting with the OPC server and enter a group name

🔄 OPC Scout - Ne	w Project1					
File View Server	?					
🖻 🖬 🈹	盘加					
Servers and groups		Items incl. statu	s information			
🖃 🚣 Server(s)			Item Names		Value	Format
📄 🗐 Local Se	erver(s)	1				
😑 😾 OPC	SimaticNET					
6	New aroun]	1			-	
	Add Group				Ň	
	Group Propertie	s:				
E Bernote	Enter a 'Group N	ame':				
bbA K	FDL					
	1					
	Create new grou	ip active	v			
	Requested upda	ate rate in ms	500		-	
1						
J Successfully connec						
	Extended	<u>0</u> K	Cancel	Apply		

Double-click the OPC group which you have created. The "OPC-Navigator" opens. You will now see your protocols in the OPC-Navigator. Double-click on "FDL". The connection name you configured in NetPro appears.



Figure	7-2	OPC-Navigator
Iguie	1-2	Or C-Mavigator

Nodes	Leaves	Item Nam Ba
Connections		
🕀 🍻 DX		
🖻 💏 NDP2:		
🖻 💏 NDP:		
🖻 📥 VFDL:		
庄 💏 IICP 5611		
庄 💏 VFMS:		
🕀 💏 NPNIO:		
🔃 🏄 \S7:		
🖻 🏘 \SNMP:		
🗄 🚰 \SB:		

Double-click the FDL connection to define new items and add existing items respectively for the communication.

In the OPC-Navigator select "send". In the middle section appears an item. Move this "send" item to the right section with the button " \rightarrow ".

Double-click the "send"item in the right section.

Figure 7-3 adding the "send"item

NODE Novinsk

Nodes Connections - 44 DX	Leaves Item Nam Basis OrgName Send FDL:[FDL FDL:[FDL Conn	The listed Item(s) will be added to Group FDL:(FDL Connection1)send
	Modify an Item Enter an item with the following Syntax: [Devicename]Itemname [FDL:[FDL Connection1]send	<u>2</u> <u><u><u> </u></u></u>
⊕ good vFM3. ⊕ good vPN10: ⊕ good vS7: ⊕ good vS7: ⊕ good vS7:	Enter an Item Cancel	Eilter QK Cancel
send is selected		1/26/2004 8:20 AM

Change the name of the "send" item (see Figure 7-4 changing the name of "send" item) and click the button "Modify Item".



Figure 7-4 changing the name of "send" item

🚰 Modify an Item	×
Enter an item with the following Syntax: [Devicename]Itemname	
FDL:[FDL Connection1]send10,80,10	
Modify Item Cancel	
Enter an Item	

NOTICE The item "... send 10, B0 ..." means, that a send buffer of 10 Bytes is reserved on the PC station. Starting at Byte 0 of this buffer, 10 Bytes are sent to the S5 station.

In the OPC-Navigator select "receive". Move the existing "receive" item which appears the middle section to the list in the right section with the button " \rightarrow ".

Click the button "OK".

Figure 7-5 adding the "receive" item

Nodes	Leaves	Item Nam	Basis	OrgName		The listed Ite	m(s) will be ad	ded to Group
Connections	○ receive	FDL:[FDL	FDL:[FDL Conn			FDL:[FDL Co FDL:[FDL Co	nnection1]rec nnection1]sen	eive d10,80,10
■ #4 \DP:								
□								
FDL Connection1					>			
🖅 💼 send					<u></u>			
E receive					≤			
						1		
teres: teres: teres: teres:								
±- 44 \S7:								
E - M \SNMP:								

The items are added in the OPC Scout. If the quality is good the connection is established and it's possible to read and write the items respectively.



Figure 7-6 OPC-Scout

0								
OPC Scout - New Project1								
Elle View Server Group Item ?								
Servers and groups	Items inc	cl. status information						
⊡ 🚣 Server(s)		Item Names	Value	Format	Туре	Access	Quality	Time Stamp (UTC)
E-B Local Server(s)	1	FDL:[FDL Connection1]send10,B0,10	{0 0 0 0 0 0 0 0	Original	uint8[]	RW	good	01/26/2004 16:18:26.795
OPC.SimaticNET	2	FDL:[FDL Connection1]receive	{0 0 0 0 0 0 0 0	Original	uint8[]	R	good	01/26/2004 16:18:26.795
FDL	3							
[New group]								
OPC.SimaticNET.DP								
OPC.SimaticNET.PD								
ProhDrive.ProhlServer								
Hemote Server(s)								
Add Hemote Servers(s)								

Double-click the column value of the "send" item to write values to the send buffer.

嫯 Write Value(s) to the	Item(s)		×
Value			
{10 11 12 13 14 15 16 17 18	19)		
Formatconversion			
Original	(• <u>s</u> ync write		
Contraction of the second seco	C Async write		
C Hex			
C Binary		i venna f	1
	ΩK	Cancel	Apply

The default structure of the value input $\{0|0\}$ must not be modified. Only the values themselves may be modifying $\{1|1\}$.

Even if only one byte has changed, all bytes of an array (as used here) will always write in a write job.

Figure 7-8 successful write job

	Item Names	Value	/rite Resu	Error
1	FDL:JFDL-Verbindung-1]receive	{10 11 12 13 1		
2	FDL:(FDL-Verbindung-1)send10.80.10	{10 11 12 13 1	OK	The operation completed successfully
3				



With the services send and receive successful writing of data must be checked in the columns "Write Result" and "Error". The columns "Write Result" and "Error" and "Error" and be made visible in the "View \rightarrow Options" menu.

8 Basic configuration instruction

8.1 Interface number (SSNR)

- The interface number of the CP is assigned in the configuration tool of the CP 5431 "SINEC NCM COM 5431" in the (Edit → CP Init) dialog.
- The SSNR must be specified as a parameter in all communication blocks of the PLC (FB120, FB121, FB125, FB126 and FB127).
- The interface number must be divisible by 4 (0, 4, 8, 16...).

8.2 SEND (FB120) and RECEIVE (FB121), SEND_A (FB126) and RECV_A (FB127), SYNCHRON (FB125)

- The values specified for QLAE and ZLAE are word values (QLAE = 0, 10 → send 10 words; ZLAE = 0, 10 → receive 10 words).
- The PAFE and ANZW parameters are output parameters. These are used for diagnostics and job monitoring. For more detailed information, refer to the manuals on the CPs.
- The job number (A-NR) specifies the connection configured on the CP (see Figure 6-2 FB120 "SEND" call and Figure 6-3 FB121 "RECEIVE" call).
- The blocks must be called using unconditional calls (for example JU FB120).

9 History

Version	Date	Changes
V 1.0	28.03.2008	First Issue